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(54) [Title of the Invention] Coordinate Input Apparatus

(57) [Abstract]

[Problem]

To realize a coordinate input apparatus wherein the same operation section is used to perform coordinate input actions and click input actions, and coordinate input and click actions are clearly distinguished, and there is a feel of operation.

[Means for Resolving the Problem] An apparatus is configured such that a surface of a coordinate input apparatus 11 is a touch panel section 12, and when the touch panel section 12 is pressed down, a switch action can be performed with a switch section comprising a protrusion 15, button sensor 16 and spring 17.

[Claims]

[Claim 1] A coordinate input apparatus provided with front panel means that operates as a touch panel having a coordinate input function and switch means for turning a contact point ON or OFF by pressing down on the front panel means.

[Claim 2] A coordinate input apparatus comprising a plurality of unit coordinate input means arrayed in series, such unit coordinate input means comprising front panel means that operates as a touch panel having a coordinate input function and switch means for turning a contact point ON or OFF by pressing down on said front panel means.

[Claim 3] A coordinate input apparatus comprising unit coordinate input means provided with front panel means that operates as a touch panel having a coordinate input function and two switch means for turning a contact point ON or OFF independently by pressing down on the right or left end of said front panel means.

[0001] [Detailed Explanation of the Invention]

The present invention relates to an apparatus for inputting coordinate positions on the output screen of a computer or communications terminal or the like.

[0002] [Background Technology]

When coordinate input or a switch action is to be made from an output screen of a conventional computer terminal or mobile terminal for communications, etc., in order to input coordinates in a fixed frame on the output screen, coordinates are indicated by tracing positions on a touch panel, and with a separate, momentary touch on the touch panel, a click action is performed as a switch operation.

[0003] Alternatively, coordinates are input with a fixed frame on the output screen as a touch panel, and a button for clicking is placed outside the fixed frame and used for click input.

[0004] However, with the coordinate input action or click action as in the former, both actions are touch actions, and which function is to be implemented is determined based on time of touching. With such an indefinite input action as a momentary touch, the feel of clicking, of having definitely made an input, suffers, and because such action is indefinite to a computer too, there are such problems as operations not being performed as instructed or the wrong function operating.

[0005] In a method as in the latter, because the button for clicking is outside the fixed frame, there is the problem that operability suffers.

[0006] [Problems the Invention Aims to Solve]

As described above, conventional coordinate input and switch actions using an output screen have many errors occur due to incomplete input actions, and are inconvenient in terms of a feel of use and operability.

[0007] It is an object of the present invention to resolve these problems by providing a coordinate input device wherein, while using the same rectangular frame, coordinate input is performed using a touch panel and click is performed by pressing a button, thus clearly differentiating between coordinate input

and click actions, and achieving a click function that has a feel of an operation being performed, and wherein coordinate input with few errors and excellent operability is achieved.

[0008] [Means for Resolving the Problem]

To achieve the above object, the coordinate input apparatus of the present invention is provided with front panel means that operates as a touch panel having a coordinate input function and a switch means for turning a contact point ON or OFF by pressing down on the front panel means.

[0009] Thus the same operating section is used to perform coordinate input using a touch panel and click by pressing a button; thus coordinate input and click actions are clearly differentiated and a click function with a feel of operation can be realized.

[0010] Another coordinate input apparatus of the present invention comprises a plurality of unit coordinate input means in series, such unit coordinate input means comprising front panel means that operates as a touch panel having a coordinate input means and switch means for turning a contact point ON or OFF by pressing down on the front panel means.

[0011] the same operation section is used to perform coordinate input using the touch panel and click by pressing a button; thus coordinate input and click actions are clearly differentiated, and in addition to realizing a click function with a feel of operation, two-button handling is possible.

[0012] Yet another coordinate input apparatus of the present invention comprises front panel means that operates as a touch panel having a coordinate input function, and two switch means for independently turning a contact point ON or OFF by pressing on a right or left end of the front surface panel means. Thus the same operation section is used to perform coordinate input using the touch panel, and click by pressing down a button; thus coordinate input and click actions are clearly differentiated, and in addition to realizing a click function with a feel of operation, two-button handling is possible and the operation section can be made small.

[0013]

[Embodiments] In the invention of claim 1, because front panel means that operates as a touch panel having a coordinate input function and switch means for turning a contact point ON or OFF by pushing down front panel means are provided, the same operation section is used to perform coordinate input using a touch panel and click by pressing down a button; thus coordinate input and click actions are clearly differentiated, and a click function with a feel of operation can be realized.

[0014] In the invention of claim 2, a plurality of unit coordinate input means are arrayed in series, such unit coordinate input means comprising front panel means that operates as a touch panel having a coordinate input function, and switch means for turning a contact point ON or OFF by pushing down the front panel means; therefore, the same operation section is used to perform coordinate input with a touch panel and click by pressing a button; thus coordinate input and click actions are clearly differentiated, a click function with a feel of operation is realized, and two-button handling is possible.

[0015] Further, in the invention of claim 3, because surface panel means that operates as a touch panel having a coordinate input function and two switch means for turning a contact point ON or OFF individually by pushing down on the right or left end of surface panel means are provided, the same

operation section is used to perform coordinate input using the touch panel, and click by pressing a button; thus coordinate input and click actions are clearly differentiated, a click function with a feel of operation is realized, two-button handling is possible, and the operation section can be made small.

[0016] Embodiments of the coordinate input apparatus according to the present invention will be explained in detail with reference to the attached drawings.

[0017] (Embodiment 1) This coordinate input apparatus is provided with one fixed button and a touch panel sensor on top of this button.

[0018] FIG. 1 shows a coordinate input apparatus, and (a) is a front view, (b) is a lateral view before the button is pressed, (c) is a lateral view after the button is pressed. In FIG. 1, 11 is an input apparatus (a click button with a touch panel) attached to a mobile terminal 21, 12 is a touch panel section. 16 is a button sensor, and 15 is a protrusion for pressing the button sensor 16. 17 is a button spring, and 18 is a trajectory taken when the touch panel section 12 is traced.

[0019] FIG. 2 is an external view as seen from above of a mobile terminal 21 having installed therein the coordinate input apparatus 11. In this diagram, 22 is an input apparatus attached to the mobile terminal 21 (i.e., the input apparatus 11), and 23 is a display of the mobile terminal.

[0020] FIG. 3 is an explanatory diagram indicating the operation points on the display 23 of the mobile terminal 21. In this diagram, 31 a display of the mobile terminal similar to the display 23 above, 32 is a mouse pointer and 33 shows the mouse pointer after movement.

[0021] Next, operations of this embodiment will be explained. When the surface of the touch panel section 12 on top of the input apparatus 11 is touched as in the trajectory 18, as shown in FIG. 3, the mouse pointer 32 on the mobile terminal display moves from the position of the legend 32 to the position of the legend 33. In this manner coordinates can be designated.

[0022] If the touch panel section 12 is pushed downward firmly, the protrusion 15 is pushed downward, and the button sensor 16 is depressed. As a result, the state indicated in FIG. 1 (b) becomes the state indicated in FIG. 1 (c). If the force pressing down is released, the button section of the input apparatus 11 returns to the state of FIG. 1 (b) due to the force of the spring 17. Because a signal can be input into the button sensor 16 with this kind of pressing down action, a click action is realized.

[0023] The input action of a click button as that described above and the coordinate input action from the touch panel section 12 provided on top of the click button can be completely divided. In addition, these two input actions can be performed by the same input apparatus, and coordinate input with few errors and excellent operability can be realized.

[0024] (Embodiment 2) The coordinate input apparatus according to this embodiment is provided with two fixed buttons side by side and a touch panel sensor on top of these buttons.

[0025] The external view as seen from above of a mobile terminal having this coordinate input system is the same as FIG. 1 and the explanatory diagram indicating the operation points on the display of the mobile terminal is the same as FIG. 3

[0026] FIG. 4 (a) is a front view showing the coordinate input apparatus (click button with touch panel divided into two parts). In FIG. 4 (a), 41 is an input apparatus, 42 is a left touch panel section, 43 is a right touch panel section, and 44 is the divider between these right and left touch panel sections. 49 is a trajectory when the upper surface of the left touch panel section is traced.

[0027] Next, the operations of this embodiment will be explained. With this fixed coordinate apparatus, coordinate input actions and click actions can be performed in the same place so that operability does not suffer, and the actions are clearly divided into a touching action and pressing action, and the feel of clicking, of definitely having pressed a button, is obtained.

[0028] When the left touch panel section 42 on the top left side of the input apparatus 41 is touched, only the left touch panel section 42 can be used, and the right touch panel section 43 cannot be used. Thus these touch panel sections are constituted such that automatic switching takes place, with the side currently being touched operating and the opposite side not responding.

[0029] In this state, when the left touch panel section 42 is touched so as to describe a trajectory 49, input cannot be made on the right touch panel section 43, and as shown in FIG. 3, on the display 31 of the mobile terminal the mouse pointer 32 moves to the position of the mouse pointer 33.

[0030] Next, if a click action is to be performed using the left touch panel section 42, by pressing down firmly on the left touch panel section 42, the button apparatus 47 is pressed down, and the state of FIG. 4 (b) changes to the state of FIG. 4 (c). When the pressing down force is released, the button apparatus 47 returns to the state of FIG. 4 (b) by the force of a spring, and a click action is performed.

[0031] Incidentally, with the coordinate input functions of the touch panel sections 42, 43, input is only possible on the side currently being touched, and input is not possible on the reverse side; however, with respect to click input, whether the left touch panel section 42 is touched or not, if the button apparatus 48 of the right touch panel section 43 is pressed, the state will change to that shown in FIG. 4 (d), without regard to touch panel section, and a right click action can be performed. Here, the meaning of a right click action and left click action may be the same or different.

[0032] With such a constitution, coordinate input and click actions can be performed only within the frame of the input apparatus 41; the two operations are clearly differentiated, and two-button handling is possible.

[0033] (Embodiment 3) The coordinate input apparatus according to this embodiment is constituted such that seesaw-type action of the buttons is allowed, and two-button handling is possible depending on the position at which a button is pressed, and a touch panel sensor is provided on top of the button.

[0034] The external view seen from above of a mobile terminal having this coordinate input apparatus is the same as FIG. 1, and the explanatory drawing of the operation points on the mobile terminal display is the same as FIG. 3.

[0035] FIG. 5 (a) is a front view showing the coordinate input apparatus (click button with touch panel). In FIG. 5 (a), 51 is an input apparatus, 52 is a touch panel section and 59 is a trajectory when the upper surface of the touch panel section is traced.

[0036] FIG. 5 (b) is a lateral view of the coordinate input apparatus before the button of the touch panel section 52 is pressed, and FIG. 5 (c) is a lateral view after the left button apparatus 57 has been pressed. 56 is a support point of the touch panel section 52.

[0037] Next, actions of this embodiment will be explained. With this fixed coordinate input apparatus, it is possible to perform coordinate input actions and click actions in the same location so that operability does not suffer, and the actions are clearly divided into a touching action and pressing action, and the feel of clicking, i.e., of having definitely pressed a button, is obtained.

[0038] When the touch panel section 52 on top of the input apparatus 51 is touched so as to describe a trajectory 59, the mouse pointer 32 on the display 31 of the mobile terminal moves to the position of the mouse pointer 33.

[0039] Next, actions when a click action is performed using the touch panel 52 will be explained. When a left click is to be performed, the left button apparatus 55 is pressed down by pressing firmly on the left side of the touch panel section 52, and the state of FIG. 5 (b) changes to the state of 5 (c). If the pressing force is released, the left button apparatus 55 returns to the state of FIG. 5 (b) by the force of a spring, and a left click action is performed.

[0040] When a right click is to be performed, the right button apparatus 57 is pressed down by pressing down the right side of the touch panel 52, and the state of FIG. 5 (b) becomes the state of FIG. 5 (d). If the force is released, the right button apparatus 57 returns to the state of FIG. 5 (b) due to the force of a spring, and a right click action is performed.

[0041] With such a constitution, coordinate input and click actions are possible only within the frame of the input apparatus 51, the two actions are clearly differentiated and two-button handling is possible.

[0042]

[Effect of the Invention] With the invention as explained above, a surface of a coordinate input apparatus operates as a touch panel, and when the touch panel section is pressed down, switch actions can be performed; therefore, a coordinate input apparatus is realized wherein coordinate input and click actions can be performed in a single operation frame, sensitive operability can be maintained, two actions can be clearly differentiated, and there is a click feel and few erroneous operations.

[Brief Explanation of the Drawings]

FIG. 1 is a drawing showing a coordinate input apparatus related to a first embodiment of the present invention.

FIG. 2 is an external view seen from above of a mobile terminal equipped with a coordinate input apparatus related to any of the first through third embodiments of the present invention.

FIG. 3 is an explanatory diagram showing the operation points on the display of the mobile terminal related to any of the first through third embodiments of the present invention.

FIG. 4 is a drawing showing a coordinate input apparatus related to a second embodiment of the present invention.

FIG. 5 is a drawing showing a coordinate input apparatus related to a third embodiment of the present invention.

[Explanation of Legends]

11, 22: mobile terminal input apparatus
12: touch panel section
15: protrusion
16: button sensor
17: spring
18: trajectory on touch panel section
21: mobile terminal
23, 31: display of mobile terminal
32: mouse pointer
33: mouse pointer after movement
41: mobile terminal input apparatus
42: left touch panel section
43: right touch panel section
44: divider
47, 48: button apparatus
49: trajectory of left touch panel section
51: input apparatus
52: touch panel section
55: left button apparatus
56: touch panel fulcrum
57: right button apparatus
59: touch panel trajectory